

WHAT IS CLAIMED IS:

1. A method for identifying a wireless serving node for a mobile unit, comprising:

5 receiving a wireless registration request at a control node for a wireless serving node cluster;

determining a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request; and

10 generating a wireless registration response containing an identifier for the control node associated with the registration request if the control node is not the control node associated with the registration request.

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2. The method of Claim 1, further comprising:

receiving a message regarding wireless sessions being managed by a serving node in the cluster; and

20 updating a database containing information regarding wireless sessions being managed by serving nodes in the cluster.

3. The method of Claim 2, further comprising receiving messages regarding load and wireless sessions
25 for every serving node in the cluster.

4. The method of Claim 1, further comprising:

determining whether a serving node in the cluster is managing a wireless session associated with the registration request if the control node is the control node associated with the registration request; and

generating a wireless registration response containing an identifier for the serving node managing the wireless session if a serving node in the cluster is managing a wireless session associated with the registration request.

5. The method of Claim 4, wherein determining whether a serving node in the cluster is managing a wireless session associated with the registration request comprises accessing a database containing wireless session information for serving nodes in the cluster.

6. The method of Claim 1, further comprising:

selecting a serving node in the cluster to manage the wireless session if the control node is the control node associated with the registration request; and

generating a wireless registration response containing an identifier for the selected serving node.

7. The method of Claim 6, wherein selecting a serving node in the cluster to manage the wireless session comprises maintaining load balancing between the serving nodes.

8. The method of Claim 1, further comprising:

determining whether a serving node in the cluster is managing a wireless session associated with the registration request if the control node is the control node associated with the registration request and the registration request is not for a new wireless session;

generating, if a serving node in the cluster is managing a wireless session associated with the registration request, a wireless registration response containing an identifier for the serving node managing the wireless session;

selecting a serving node in the cluster to manage the wireless session if the control node is the control node associated with the registration request and the registration request is for a new wireless session; and

generating a wireless registration response containing an identifier for the selected serving node.

9. The method of Claim 1, wherein the registration request comprises an All-Registration Request.

10. The method of Claim 1, further comprising:

receiving a message regarding a control node of another cluster; and

updating a database containing information regarding control nodes, the database containing identifiers for control nodes.

11. The method of Claim 1, wherein determining a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request comprises performing a hash method
5 on the mobile unit identifier.

12. The method of Claim 11, wherein determining a control node associated with the registration request by using an algorithm on a mobile unit identifier in the
10 registration request further comprises performing a modulo operation on the mobile unit identifier, using a number associated with the loading between clusters as the basis for the operation and the remainder of operation as an index into a database containing
15 identifiers for control nodes.

13. The method of Claim 1, wherein the identifier of the associated control node is an Internet protocol address.
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14. A set of logic for identifying a wireless serving node for a mobile unit, the logic encoded in media and operable to:

5 receive a wireless registration request at a control node for a wireless serving node cluster;

determine a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request; and

10 generate a wireless registration response containing an identifier for the control node associated with the registration request if the control node is not the control node associated with the registration request.

15 15. The logic of Claim 14, wherein the logic is further operable to:

receive a message regarding wireless sessions being managed by a serving node in the cluster; and

20 update a database containing information regarding wireless sessions being managed by serving nodes in the cluster.

25 16. The logic of Claim 15, wherein the logic is operable to receive messages regarding load and wireless sessions for every serving node in the cluster.

17. The logic of Claim 14, wherein the logic is further operable to:

determine whether a serving node in the cluster is managing a wireless session associated with the registration request if the control node is the control node associated with the registration request; and

generate a wireless registration response containing an identifier for the serving node managing the wireless session if a serving node in the cluster is managing a wireless session associated with the registration request.

18. The logic of Claim 17, wherein determining whether a serving node in the cluster is managing a wireless session associated with the registration request comprises accessing a database containing wireless session information for serving nodes in the cluster.

19. The logic of Claim 14, wherein the logic is further operable to:

select a serving node in the cluster to manage the wireless session if the control node is the control node associated with the registration request; and

generate a wireless registration response containing an identifier for the selected serving node.

20. The logic of Claim 19, wherein selecting a serving node in the cluster to manage the wireless session comprises maintaining load balancing between the serving nodes.

21. The logic of Claim 14, wherein the logic is further operable to:

5 determine whether a serving node in the cluster is managing a wireless session associated with the registration request if the control node is the control node associated with the registration request and the registration request is not for a new wireless session;

10 generate, if a serving node in the cluster is managing a wireless session associated with the registration request, a wireless registration response containing an identifier for the serving node managing the wireless session;

15 select a serving node in the cluster to manage the wireless session if the control node is the control node associated with the registration request and the registration request is for a new wireless session; and

20 generate a wireless registration response containing an identifier for the selected serving node.

22. The logic of Claim 14, wherein the registration request is an All-Registration Request.

23. The logic of Claim 14, wherein the logic is further operable to:

receive a message regarding a control node of another cluster; and

30 update a database containing information regarding control nodes, the database containing identifiers for control nodes.

24. The logic of Claim 14, wherein determining a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request comprises performing a hash function on the mobile unit identifier.

25. The logic of Claim 24, wherein determining a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request further comprises performing a modulo operation on the mobile unit identifier, using a number associated with the loading between clusters as the basis for the operation and the remainder of the operation as an index into a database containing identifiers for control nodes.

26. The logic of Claim 14, wherein the identifier of the associated control node is an Internet protocol address.

27. A system for selecting a wireless serving node for a mobile unit, comprising:

means for receiving a wireless registration request at a control node for a wireless serving node cluster;

5 means for determining a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request; and

means for generating a wireless registration response containing an identifier for the control node
10 associated with the registration request if the control node is not the control node associated with the registration request.

28. The system of Claim 27, further comprising:

15 means for receiving a message regarding wireless sessions being managed by a serving node in the cluster; and

means for updating a database containing information regarding wireless sessions being managed by serving
20 nodes in the cluster.

29. The system of Claim 28, wherein the means for receiving also receives messages regarding load and wireless sessions for every serving node in the cluster.

30. The system of Claim 27, further comprising:

means for determining whether a serving node in the cluster is managing a wireless session associated with the registration request if the control node is the control node associated with the registration request and the registration request is not for a new wireless session;

means for generating, if a serving node in the cluster is managing a wireless session associated with the registration request, a wireless registration response containing an identifier for the serving node managing the wireless session;

means for selecting a serving node in the cluster to manage the wireless session if the control node is the control node associated with the registration request and the registration request is for a new wireless session; and

means for generating a wireless registration response containing an identifier for the selected serving node.

31. The system of Claim 30, wherein determining whether a serving node in the cluster is managing a wireless session associated with the registration request comprises accessing a database containing wireless session information for serving nodes in the cluster.

32. The system of Claim 30, wherein selecting a serving node in the cluster to manage the wireless session comprises maintaining load balancing between the serving nodes.

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33. The system of Claim 27, wherein the registration request is an All-Registration Request.

34. The system of Claim 27, further comprising:
10 means for receiving a message regarding a control node of another cluster; and

means for updating a database containing information regarding control nodes, the database containing identifiers for control nodes.

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35. The system of Claim 27, wherein determining a control node associated with the registration request by using algorithm on a mobile unit identifier in the registration request comprises performing a hash function
20 on the mobile unit identifier.

36. The system of Claim 35, wherein determining a control node associated with the registration request by using algorithm on a mobile unit identifier in the
25 registration request further comprises performing a modulo operation on the mobile unit identifier, using a number associated with the loading between clusters as the basis for the operation and the remainder of the operation as an index into a database containing
30 identifiers for control nodes.

37. The system of Claim 27, wherein the identifier of the associated control node is an Internet protocol address.

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38. A method for identifying a wireless serving node for a mobile unit, comprising:

receiving messages regarding load and wireless sessions for serving nodes in a cluster at a control node
5 for the cluster;

updating a database containing information regarding wireless sessions being managed by serving nodes in the cluster based on the messages;

updating a database containing information regarding
10 loading of the serving nodes in the cluster based on the messages;

receiving messages regarding control nodes of other clusters at the control node;

updating a database containing information regarding
15 control nodes based on the messages, the database containing addresses for control nodes;

receiving an All-Registration Request at the control node, the registration request containing an International Mobile Subscriber Identifier;

20 determining an address for a control node associated with the registration request by performing a modulo operation on the identifier, the basis of the operation being associated with loading between clusters and the remainder of the operation being an index into the
25 database containing information regarding control nodes;

generating an All-Registration Reply containing an address for the control node associated with the registration request if the control node is not the control node associated with the registration request;

determining, if the control node is the control node associated with the registration request and the registration request is for a new wireless session, whether a serving node in the cluster is managing a
5 wireless session associated with the registration request by accessing the database containing information regarding wireless sessions being managed by serving nodes in the cluster;

generating, if a serving node in the cluster is
10 managing a wireless session associated with the registration request, an All-Registration Reply containing an address for the serving node managing the wireless session;

selecting, if the control node is the control node
15 associated with the registration request and the registration request is not for a new wireless session, a serving node in the cluster to manage the wireless session by accessing the database containing information regarding loading of the serving nodes in the cluster;
20 and

generating an All-Registration Reply containing an address for the selected serving node.

39. A system for identifying a wireless serving node for a mobile unit, comprising:

a serving node cluster comprising:

5 a plurality of wireless serving nodes, each serving node operable to manage a plurality of wireless sessions;

a control node operable to:

receive a wireless registration request for the cluster,

10 determine a control node associated with the registration request by using an algorithm on a mobile unit identifier in the registration request, and

generate a wireless registration response containing an identifier for the control node associated with the registration request if it is not the control node associated with the registration request; and

15 a communication network coupled to the serving nodes and the control node, the communication network allowing the serving nodes and the control node to exchange data.

40. The system of Claim 39, wherein the control node is further operable to:

25 receive a message regarding wireless sessions being managed by one of the serving nodes; and

update a database containing information regarding wireless sessions being managed by serving nodes in the cluster.

41. The system of Claim 40, wherein the control node is operable to receive messages regarding load and wireless sessions for every serving node in the cluster.

5 42. The system of Claim 40, wherein the control node is further operable to generate a message to poll a serving node in the cluster for wireless session and loading information.

10 43. The system of Claim 39, wherein the control node is further operable to:

 determine, if the control node is the control node associated with the registration request and the registration request is not for a new wireless session, whether one of the serving nodes is managing a wireless session associated with the registration request;

 generate, if one of the serving nodes is managing a wireless session associated with the registration request, a wireless registration response containing an identifier for the serving node managing the wireless session;

 select, if the control node is the control node associated with the registration request and the registration request is for a new wireless session, one of the serving nodes to manage the wireless session; and

 generate a wireless registration response containing an identifier for the selected serving node.

44. The system of Claim 39, wherein the control nodes is further operable to receive data regarding control nodes of other clusters and update a database containing information regarding other control nodes, the
5 database containing identifiers for control nodes.

45. The system of Claim 39, wherein determining a control node associated with the registration request comprises performing a hash function on the mobile unit
10 identifier.

46. The system of Claim 45, wherein determining a control node associated with the registration request further comprises performing a modulo operation on the
15 mobile unit identifier, using a number associated with the loading between clusters as the basis for the operation and the remainder of the operation as an index into a database containing identifiers for control nodes.

47. The system of Claim 39, further comprising a
20 second control node, the second control node serving as a back-up to the control node.

48. The system of Claim 47, wherein the second
25 control node serves as a back-up according to the Hot Standby Router Protocol.

49. A method for identifying a wireless serving node for a mobile unit, comprising:

detecting a mobile unit in the vicinity of a base station;

5 determining that the mobile unit desires to establish a wireless data session;

determining a cluster to manage the wireless session; and

10 generating a wireless registration request for the mobile unit.

50. The method of Claim 49, wherein determining a cluster to manage the wireless session comprises determining an identifier for a control node of the
15 cluster.

51. The method of Claim 50, wherein the identifier of the control node is an Internet protocol address.

20 52. The method of Claim 49, wherein the registration request comprises an All-Registration Request.

53. The method of Claim 49, further comprising:
25 receiving a message regarding a control node; and
updating a database containing information regarding control nodes, the database containing identifiers for control nodes.

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54. The method of Claim 49, wherein determining a cluster to manage the wireless session comprises performing a hash method on the mobile unit identifier.

5 55. The method of Claim 54, wherein determining a cluster to manage the wireless session further comprises performing a modulo operation on the mobile unit identifier, using a number associated with the loading between clusters as the basis for the operation and the
10 remainder of operation as an index into a database containing identifiers for control nodes.